

**Notice of Allowability**

Application No.

10/612,857

Examiner

Tuan T. Nguyen

Applicant(s)

CHANG ET AL.

Art Unit

2824

-- The MAILING DATE of this communication appears on the cover sheet with the correspond nc address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☐ This communication is responsive to \_\_\_\_.
2. ☒ The allowed claim(s) is/are 1-9.
3. ☒ The drawings filed on 03 July 2003 are accepted by the Examiner.
4. ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some\* c) ☐ None of the:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

\* Certified copies not received: \_\_\_\_.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.

**THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.**

5. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
6. ☐ CORRECTED DRAWINGS ( as "replacement sheets") must be submitted.
- (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review ( PTO-948) attached
- 1) ☐ hereto or 2) ☐ to Paper No./Mail Date \_\_\_\_.
- (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date \_\_\_\_.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
7. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

**Attachment(s)**

1. ☒ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3. ☐ Information Disclosure Statements (PTO-1449 or PTO/SB/08), Paper No./Mail Date \_\_\_\_
4. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material
5. ☐ Notice of Informal Patent Application (PTO-152)
6. ☐ Interview Summary (PTO-413), Paper No./Mail Date \_\_\_\_
7. ☐ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☒ Other Attachment A: Search History.



RICHARD ELMS

SUPERVISORY PATENT EXAMINER

## **DETAILED ACTION**

### ***Priority***

1. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

### ***Allowable Subject Matter***

2. Claims 1-9 are allowed.
3. The following is an examiner's statement of reasons for allowance:

The prior art of record fail to disclose a test device, in combination with other cited limitations, comprising parallel first and second bar-type deep trenches capacitors disposed in the scribe line region; wherein the first and second bar-type deep trenches capacitors extend to the first and second pairs of memory cells adjacent to the first active area respectively, and are electrically coupled to bit line contacts of the first and second pairs of memory cells respectively; a first transistor having a source coupled to the first bar-type deep trench capacitor; a second transistor having a source coupled to the second bar-type deep trench capacitor; and a first bit line contact electrically coupled to drains of the first and second transistors as recited in claims 1 and 4.

Claims 2-3 and 5-6 are therefore allowed because of their dependency on claims 1 and 4; respectively.

The prior art of record further fail to disclose a method for detecting alignment of deep trench capacitors and word lines in DRAM devices, comprising: providing a wafer with at least one scribe line region and at least one memory region; forming plurality pairs of memory cells in the memory region and at least one test device in the scribe line simultaneously, wherein each

Art Unit: 2824

pair of memory cells includes active area, two deep trench capacitors deposited at two ends of the active area, two word lines disposed above the active area, and bit contact disposed between the two word lines and electrically coupled to the active area, test device including: parallel first and second bar-type deep trenches capacitors disposed in the scribe line region; wherein the first and second bar-type deep trenches capacitors extend to the first and second pairs of memory cells adjacent the first active area respectively, and electrically coupled to bit line contacts of the first and second pairs of memory cells respectively; a first transistor having source coupled the first bar-type deep trench capacitor; second transistor having source coupled to the second bar-type deep trench capacitor; and a first contact electrically coupled to drains the first second transistors; measuring a first resistance between the first bit line contact and the bit line contact of the first pair memory cells and a second resistance between the second bit line contact and line contact memory cell; and second pair of memory cell; and determining alignment the deep trench capacitors and word lines in the memory regions according alignment the first and second resistance as recited in claim 7.

Claims 8-9 are therefore allowed because of their dependency on claim 7.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Art Unit: 2824

***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tuan T. Nguyen whose telephone number is (571) 272-1880. The examiner can normally be reached on Mon-Thu-Mon-Fri.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Richard Elms can be reached on (571) 272-1869. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

TUAN T. NGUYEN  
PATENT EXAMINER

June 14, 2004



Tuan T. Nguyen  
Patent Examiner  
Art Unit 2824



RICHARD ELMS  
SUPERVISORY PATENT EXAMINER  
TECHNOLOGY CENTER 2800